CEPS LLC

FUELPROCESSOR AcidX

– Total Acid Number (TAN) reduction in fuels

Introduction

- As the global energy landscape evolves, the introduction of biofuels and variable refining practices has led to **increasing occurrences of fuels with high Total Acid Number (TAN).**

- Elevated TAN levels are directly **linked to corrosion, component wear, operational inefficiencies and high OPEX costs** —posing significant risks to engine systems.

- When TAN exceeds ISO or OEM recommendations, operators face not only **higher maintenance costs** but also potential regulatory and **warranty compliance issues.**

Root causes of a high Total Acid Number (TAN)

- Organic acids: byproducts of refining, oxidation, or contamination, i.e. naphthenic acids.
- Sulfur compounds: sulfur oxidation forms strong acids, such as sulfuric or sulfonic acids.
- Oxidation products: acids formed during storage or exposure to high temperatures.
- Contaminants: acidic cleaning agents or chemical residues in the fuel.

Abstract representation of
fuel acidity reduction from ChatGPT.

Example from a Power Plant

Reason: damaged fuel pumps and injection system

Sample taken	Density Limit 1.010 [kg/m³ @ 15°C]	Viscosity [mm²/s @ 50°C]	Water Content Limit: 0,3 [%]	Acid Number Limit: 2,5 [mg KOH/g]	Sulphur [%]	Comply with ISO 8217 or DIN / OEM requirements YES	 NO
after separator / before engine	945	405	0,07	3,1	0,47		**X**
after separator / before engine	948	518	0,06	3,5	0,51		**X**
after separator / before engine	1.102	517	0,04	3,7	0,50		**X**
after separator / before engine	946	363	0,07	3,4	0,50		**X**

Reduction to < 2,5 mg KOH / g fuel as required to comply with ISO 8217 or DIN /OEM requirements.

Product introduction (1/2)

- The FUELPROCESSOR AcidX converts not complying acid fuels into a compliant fuel with a guaranteed TAN.
- Fuel acidity reduction is achieved by adding the neutralizing agent KOH and water.
- A low value down to 1,2 mg KOH/g fuel can be reached, OEM limit is 2,5 mg KOH/g fuel.
- Only the **real time demand of fuel** according to the engine load will be prepared.
- Limited space near the engine is needed only and will fit into almost all power houses or engine rooms.
- Short installation time of of approximately 3 days plus 2 days commissioning per engine.
- Positive side effects:

    a) better atomization of the fuel and therefore a more thorough combustion leading to fuel savings

    b) less emissions (NOx, CO, HC) and Particle Matters (PM)

    c) lower Filter Smoke Number (FSN) at visible smoke

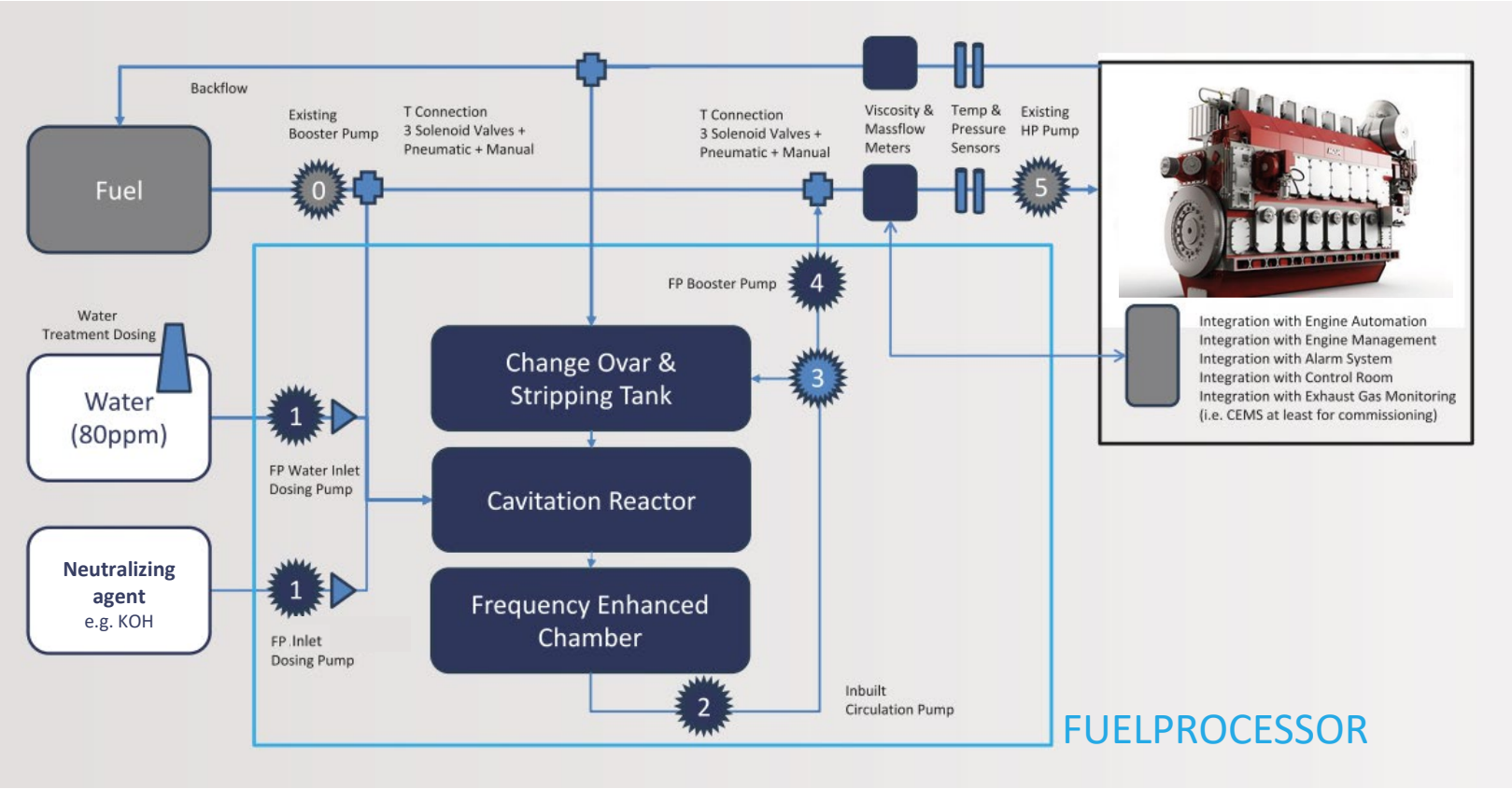
Product introduction (2/2)

- Costs for CAPEX investment + KOH + water demand have a **payback of approx. two years** by fuel savings and lower O&M.
- Robust and reliable reduction solution.
- Verified functionality, performance and durability.
- Low maintenance in time and costs.
- Assures full fallback to normal fuel supply line at any time with no impact in operation.

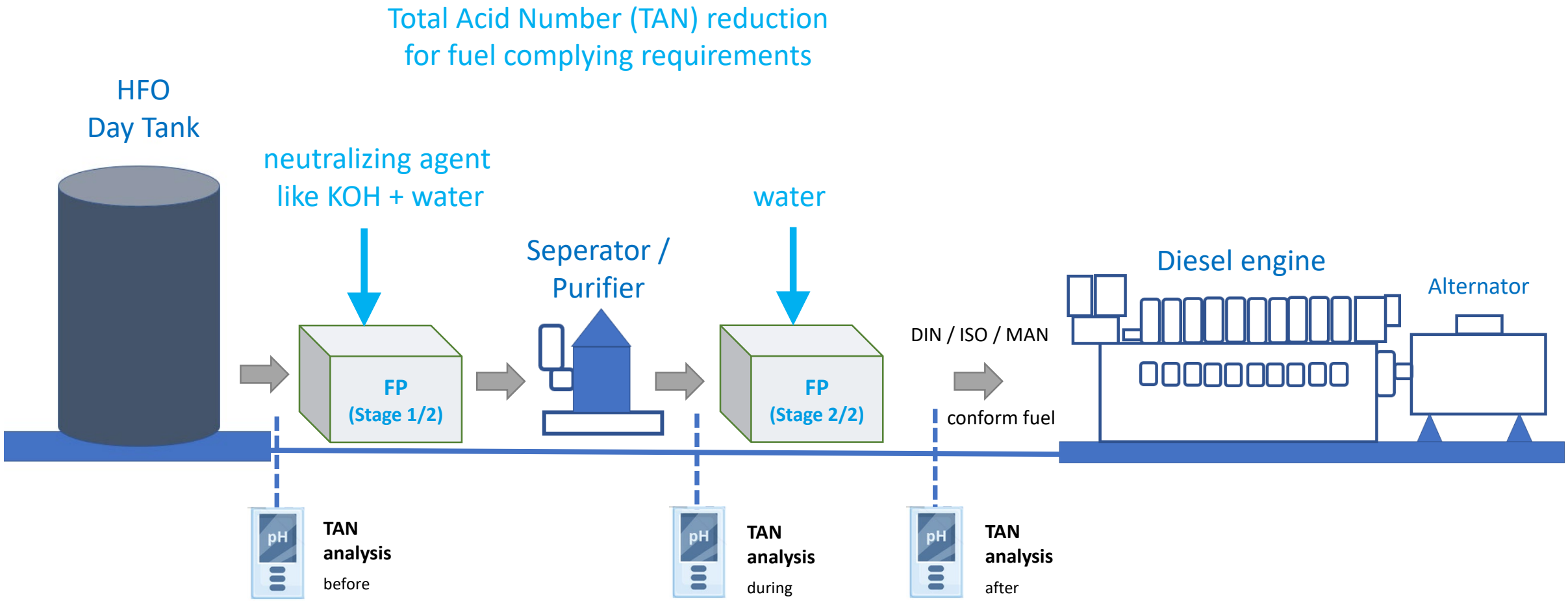
FP Unit and Control Cabinet – open up

Working scheme

- Application for 2- and 4-stroke engines with usual HFO and Diesel fuels as well as Bio-Fuels.



Example of functional flow



References

- MaK 6L M20 (1.000 kW) Diesel engine at the test bed of the University of Rostock (FVTR).

- In cooperation with the Icelandic Marine College on a fishing vessel.

Summary

Secure your fuel supply and engine integrity—partner with us for sustainable, compliant fuel management.

Problem
- High TAN causes corrosion, reduces fuel quality and increases maintenance costs.

Solution
- 2 Stage Fuel processing neutralizes and traps acidic compounds.
- Novel Real-time processing in-line neutralizes acids more effectively and increases fuel reliability.

Benefits
- Lower TAN, less corrosion, improved fuel stability and reduced operational costs.

The FUELPROCESOR AcidX solution **combines advanced fuel processing** technology with **chemical neutralization** for a **robust and cost-effective solution.** It provides **DIN/ISO compliant fuel** according to **OEM requirements.** Thus **OPEX can be reduced** and the **assets and its components will be protected** from excessive damages.

Contact us

Manufacturer

Clean Energy Power Systems LLC
CEPS
Office: Dubai, UAE
Production: Zagreb, Croatia

Promotion, Sales and Tendering

Alternative Energy Solutions
Office: Augsburg, Germany

Email: info@aes-dts.com

Web: www.aes-dts.com

Disclaimer

All data provided by Alternative Energy Solutions in this document is non-binding. This data serves informational purposes only and is especially not guaranteed in any way. Depending on the subsequent specific individual projects, the relevant data may be subject to changes and will be assessed and determined individually for each project. This will depend on the particular characteristics of each individual project, especially specific site and operational conditions.